FY04, 05 Priorities and Plans BNL Dipole R&D - Update

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LARP Dipole R&D Priorities

- Finalize magnetic design (previous R. Gupta talk)
- Open midplane mechanical analysis
- Heat transfer analysis – work to follow mechanical analysis (needs new Mohkov data)
- Develop remaining cold mass structure
- Build R&D coils, cold mass

- Base Program work:
  - Cable development
  - 10 turn coils
  - 12T magnet

LARP Dipole Mechanical Analysis

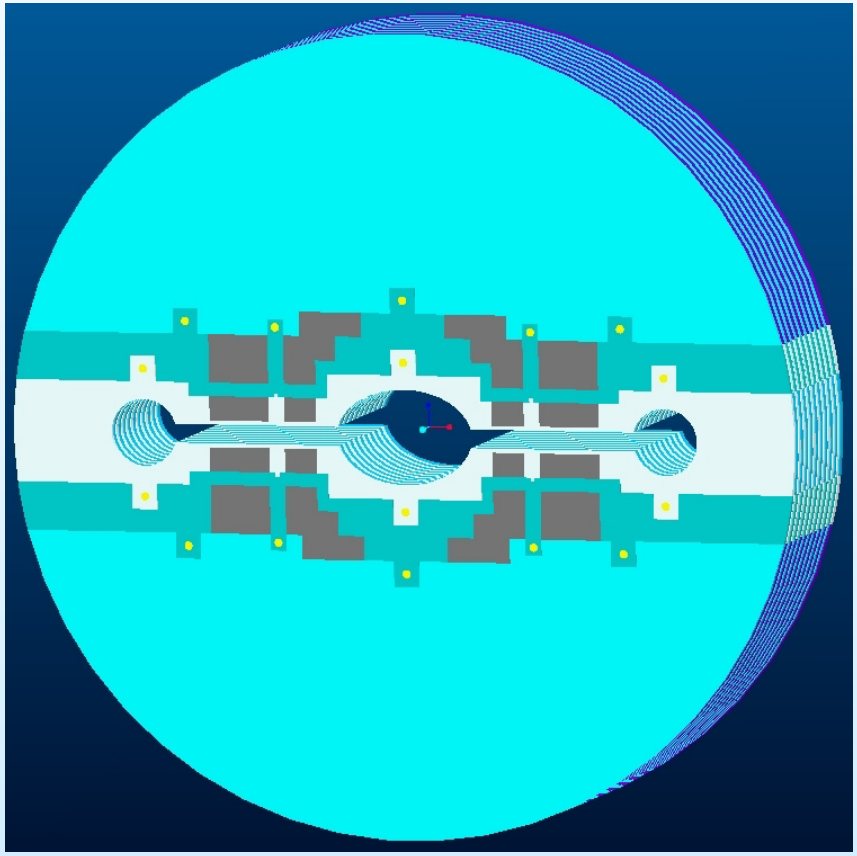
Revised Laminated Collar support

Features:

- Open midplane
- Easy (inexpensive) to build
- Accurate geometry
- Heat absorbed at 80K
- Support bridges minimize coil stress accumulation

Issues:

- Cable instability
- Deflections
- Secondary 4K heating
- Constrictive ’04, ’05 Funding (need more $ for conductor, multiple tests, alternate design, etc.)

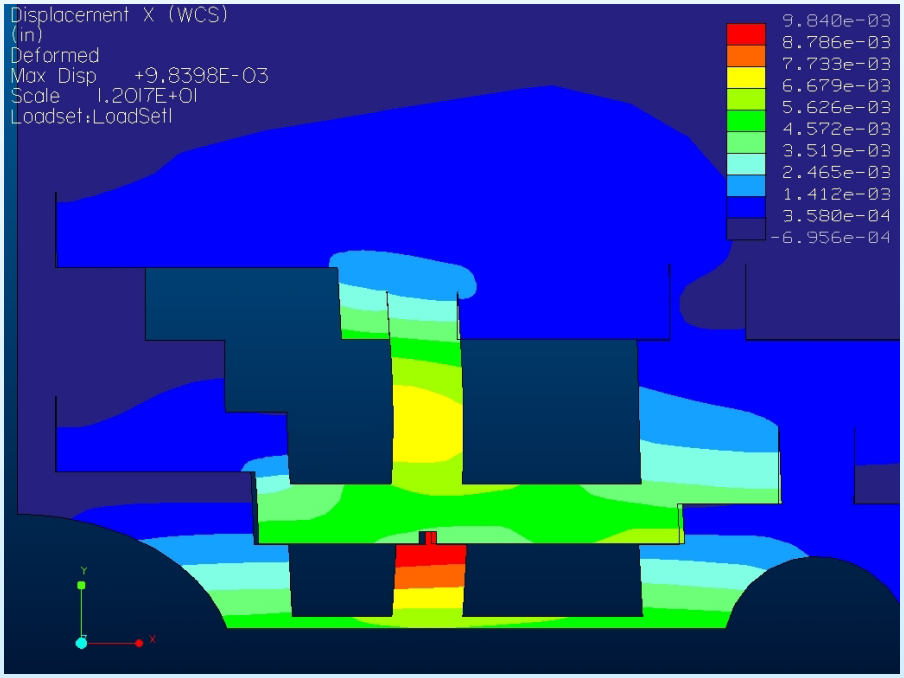


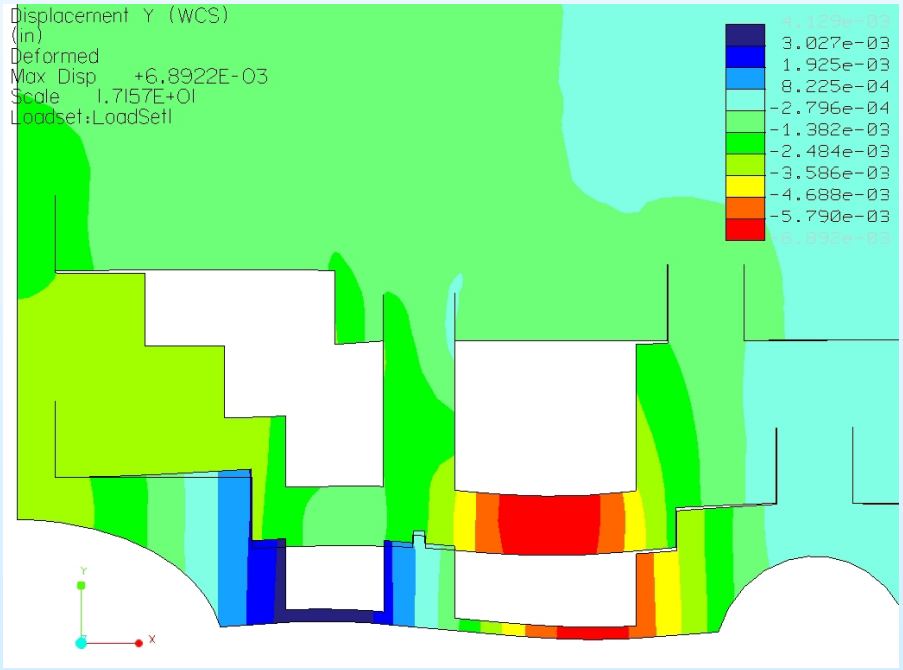
LARP Dipole Mechanical Analysis

Revised Laminated Collar support (cont'd)

X - Deflections **Y - Deflections**

max relative deflection ~4 mils

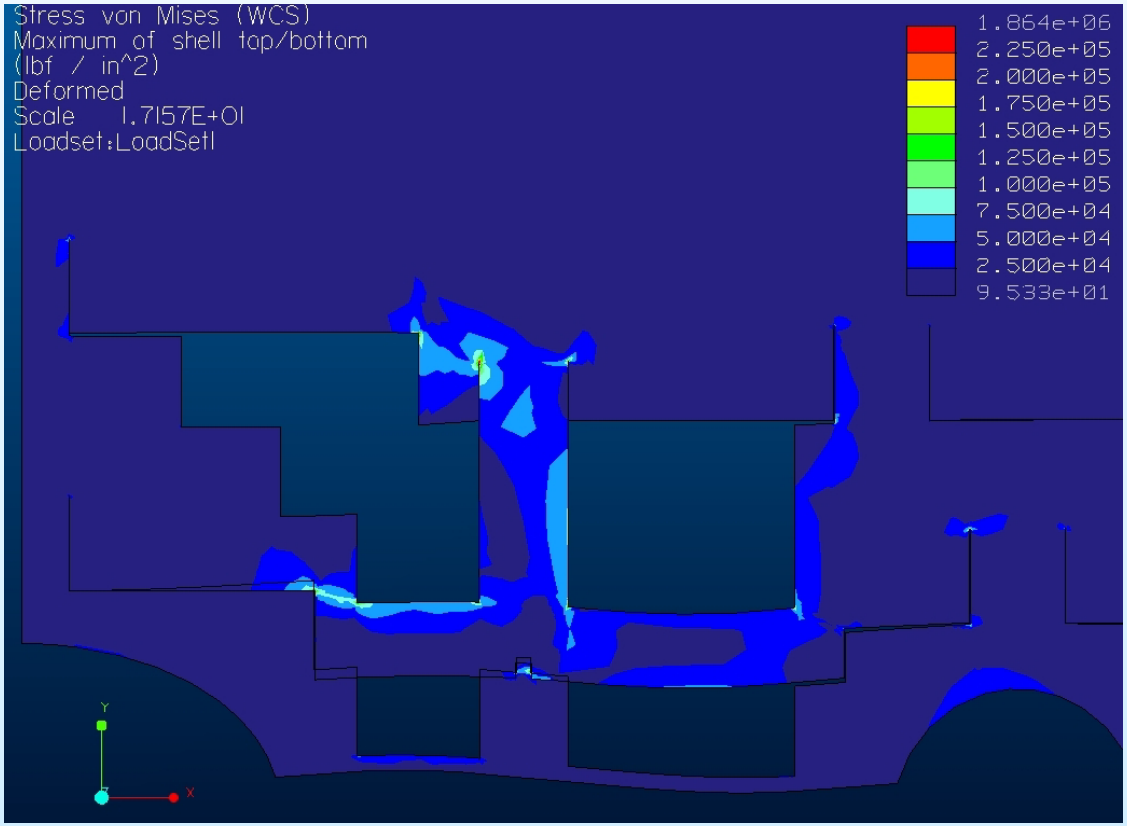




LARP Dipole Mechanical Analysis

Revised Laminated Collar support (cont'd)

Stresses

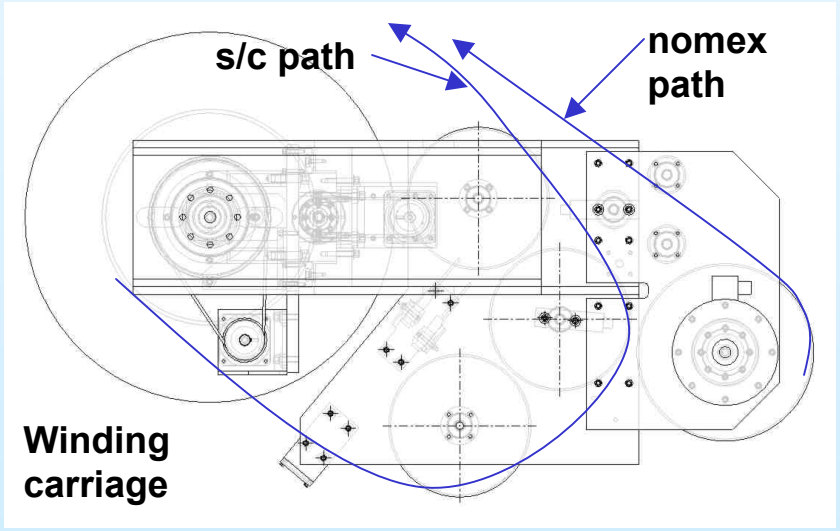


Base Program Support

Coil Winder Status

- Mechanical Assembly complete
- wiring underway
- computer interface underway

⇨ operational 3/04



FY04, FY05… Plan Summary

LARP

FY04: ($165K)

- Finalize magnetic design
- complete mechanical analysis and initiate thermal analysis
- Develop external structure to restrain collars

Iterative exercise

FY05: (~$500K)

- Complete cold mass design
- Complete thermal analysis
- Build R&D coils
- Build “simplified” cold mass

FY06:

- Test magnet in cryostat:
  - Quench / field uniformity tests
  - Heat load / temp tests

FY04, FY05 Plan Summary

Base Program Support

FY04:

- **Cable Development & testing ("need to make 1M Nb_3Sn samples work")**
- **10 turn coil winding**
- **10 turn test magnet assembly & test**
- **12T coil winding**

FY05:

- **12T magnet assembly & test**

Summary

- Good progress so far on LARP R&D and Base Program
- Lots more to be accomplished in the near term
- Continued interaction between mechanical – magnetic design –accelerator folks is crucial